



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

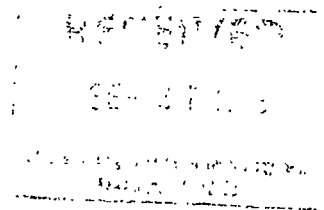
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September 22, 1999

Mr. Emil Klawitter  
Code 1823 EK  
Department of the Navy, Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop 82  
Lester, PA 19113-2090



Re: Monitoring Event 14, Sites 1, 3 & Eastern Plume  
Naval Air Station, Brunswick, Maine

Dear Mr. Klawitter:

The Maine Department of Environmental Protection (MEDEP or Department) has reviewed the report entitled Monitoring Event 14, Sites 1 and 3 and Eastern Plume, dated June 1999, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

General Comments:

1. Changes that the Navy has implemented in this monitoring event report, with input from the RAB, have greatly cut down the review time and the report is now truly a data report. Although the Navy will release interpretation of Site 1 & 3 and the Eastern Plume event data only in the annual report, it is important that we compare the concentrations reported in the event reports with trends and historical data as the data becomes available. The Department has reviewed these new data in this fashion.

Specific comments:

2. Results, Section 1.2.2, page 2, 2<sup>nd</sup> sentence:

To round out this data report, the inclusion of a new table titled "Summary of Monthly Extraction Well Pumpage, Eastern Plume" after Table 5 would be helpful. Total gallons pumped each month for each well would be easy to produce, and are figures that the Department would like to track. Table 3-1 of the 1998 Annual Report gives monthly totals in gallons per minute, which is less helpful.

3. Field Activities, Section 1.3.1, page 4, 1<sup>st</sup> para:

"... with the exception of 5 wells/piezometers located in the Eastern Plume which were sampled using a peristaltic pump (MW-105A, MW-330, MW-333, P-106, and P-111)."

Four of these wells did not show any trace of VOCs. Only P-106 produced contaminated water. P-111 is very shallow and is expected to sample groundwater above the top of the plume, and therefore, the finding of non-detects here is not surprising. However, the lack of contaminants in MW-105A and MW-330 has not yet been explained. MW-105A and MW-330 are located close to the mapped boundary of VOC > 100 ppb. The Department notes that the total volumes purged prior to sampling

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these two wells (MW-105A and MW-333) were much less than one well volume, according to the field record sheets in Appendix A.2. The Department is concerned that volatiles are being lost at some point in the sampling, or else the purging time is too small. The stabilization of field parameters as an indicator of aquifer water are questionable criteria when purge times are as small as 5 and 7 minutes and one well volume has not been removed. This was the case for MW-105A and MW-333.

At MW-330, 1.4 total well volumes were purged prior to sampling. According to Appendix A.2, this well had a static water level of 4 feet below top of casing (1 foot below land surface). The top of the screen is 24 feet below land surface. Therefore, on this date the standing water column above the screen was 23 feet. If only the water above the screen is considered, twice the volume residing within the well above the screen (13.9 L) was purged. To what depth was the length of tubing on the peristaltic pump inserted into the well? If the end of the tubing did not reach to the top of the screen (an unlikely scenario), a representative groundwater sample would likely not have been collected from the 10-foot screened interval. Evidence besides proximity to EW-4 that contaminated groundwater exists at MW-330 is a very low dissolved oxygen content (0.44 mg/L) and a negative Eh (-30 mV).

The Department does not feel this data is credible and future decisions cannot be based on these results. Therefore it would be in the best interest of the Navy to equip MW-105A, MW-330 and MW-333 with dedicated submersible pumps that are placed at mid screen.

4. Water Quality Results, Section 1.3.3, page 5:

The title of this subsection needs to be changed to "*Field Parameter Water Quality Results*".

5. Eastern Plume, Section 1.3.3.2, page 6, 3<sup>rd</sup> bullet:

"Reduced dissolved oxygen concentrations (<2.0 mg/L) were noted in 13 monitoring wells."

It is important to give more detail. A revised statement should give the Table 7 breakdown as follows: "*Reduced dissolved oxygen concentrations (<2.0 mg/L) were measured in 2 shallow monitoring wells, 9 deep sand monitoring wells, and in 2 bedrock wells.*"

It is very interesting that most monitoring wells downgradient of the confluence of Mere Brook and Merriconeag Stream north of New Gurnet Road have values of dissolved oxygen below 2.0 mg/L. This occurrence suggests that groundwater continues to flow south-southeast from the mapped southern boundary of the plume through this area.

6. Ground-Water Analytical Program, Section 1.3.4, page 6, 2<sup>nd</sup> para:

The sentence should be divided into two sentences at the semi-colon for clarity, if the precision and accuracy applies to analytes in addition to chromium.

7. Monitoring and Inspection Activities, Section 1.5.1, page 9, 2<sup>nd</sup> para:

"Completion of necessary repairs to the landfill cap and drainage system, including the drainage along the eastern border and the western drainage swale, is scheduled to be conducted in the Summer of 1999 and will be summarized in a separate document following completion."

The Department notes that a report should be forthcoming soon.

8. Interpreted Shallow Ground-Water Potentiometric Surface Contour Maps, Figures 5 and 6:

Contouring is a subjective art form, and as such, there usually are several somewhat different looking contours maps that can be produced from a data set. However, examination of these figures suggest

that some problem areas exist with the drawing of contours and/or with several data points. A discussion of significant problems follow:

The 24 and 27-foot contours between EW-2 and EW-3 on Figure 5 indicate locally very steep gradients along a narrow north-south band. Geological evidence for this is lacking. It is suspected that the measurement in P-112 is not representative, in that the January 1999 reading is higher than the April 1999, contrary to the relationship at other wells and especially at the nearby EW-2. Also, because EW-3 was shutdown on December 4, 1999 it is unlikely that a large residual water table depression would remain a month later (as the Navy indicates with a closed 27-foot contour). The primary 27-foot contour should be moved just north of MW-106, and extend to the northwest side of EW-4. It would be logical to assume that P-111, screened from 2.5 to 7.5 feet below ground surface, measures a perched water body. We note that on Figure 6, P-111 and P-112 were not given full weight in contouring. Probably, they should not be used at all in contouring.

In the vicinity of Site 1 and 3 landfill, the relationship between contour patterns outside the slurry walls and inside the slurry walls suggests that groundwater elevations inside the landfill are higher than outside the landfill. Worse yet, a relatively steep southward gradient is indicated at the open side (south) of the slurry wall. The 24 to 33-foot contours may be accurate in representing the movement of groundwater out of the landfill toward Mere Brook. Significant levels of contaminants in wells MW-202A, MW-203 (chromium), MW-218 (arsenic), and Seeps 3 and 4 suggest a southern plume pathway. The southwest tails of the 24, 27 and 30-foot contours undoubtedly must bend and trend up Mere Brook, instead of heading directly across Mere Brook. The "loop" in the 24-foot contour in Figure 6 actually indicates a flow path from inside the landfill to MW-203, which seems plausible. The Navy must improve the accuracy and reliability of contouring in this area, as chemical data and flow data are now contradictory.

9. Interpreted Deep Ground-Water Potentiometric Surface Contour Maps, Figures 8 and 10:

a.) The Department does not agree with deep aquifer contours in the general area of Sites 1 and 3 landfill. The Navy's explanation that a drawdown shadow has been created immediately south of the landfill by the slurry wall and cap is more likely due to using shallow wells (MW-218 and MW-220) in the contour database, as previously suggested by DEP. The 24-foot contour that is dead-ended before reaching the Weapons Compound should be shown as dashed in a sharp north bend (the only course it could have under the present Navy interpretation). What is the likelihood that the Weapons Compound is pumping or draining off groundwater?

b.) Is it a coincidence that the deep contours are practically a duplicate of the shallow contours in the area of the slurry wall downgradient opening? Might there be just one aquifer system in this area? Some important relationships have yet to be explained.

c.) A number of wells were frozen when visited in the January monitoring event. The lack of these data impacts the usefulness of contouring, and comparison to other events. The Department suggests that measurement rounds in January and February be dropped.

d.) On Figure 10, EW-3 should be removed from Note 2, as it was not being pumped.

10. Water Elevations within Sites 1 and 3 Landfill, Figure 12:

The Department assumes that the Navy placed both shallow-well and deep-well graphs on a single page to enhance easy comparison of trends. This stacking is commendable, but the difference of 2.5X between vertical scales is unacceptable. The scales should be identical. The slight declining trend in the deep wells is clearly visible, however, the increasing trend for three of five shallow wells is not very noticeable. MW-217B is up over 3 feet from its low in mid-1998. EP-16 and MW-210B are up almost 2 feet from January 1998 levels. This rise in shallower wells occurred despite a very dry spring

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and summer. The continuing slightly downward trend in the deeper wells (and MW-211B shown in the shallow well graph) could be due to the delayed effect of the draught in deeper strata. Overall, the different responses may be indicating the degree of geological layering in the landfill vicinity. These trends bear close watching.

11. Interpreted Total Volatile Organic Compound Concentration Contour Map, Figure 14:

As previously commented on by the EPA, it is interesting how the Navy oscillates from one event map to the next event map in where the EW-4 vicinity is located with respect to residing within the northern or southern contaminant lobe.

In Event 13, EW-4 was included in the southern lobe. In Event 14, it is included within the northern lobe. Event 14 chemical data show the same suite of contaminants are present in both wells at similar concentrations. Furthermore, because the mapped areas of MCL/MEG exceedence between these lobes is only separated by 250 feet and no monitoring wells are located in this space, the Department strongly urges the Navy to combine the lobes on future concentration maps (until such time that evidence is collect that would dispute their connection).

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,



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